

REMARKS

Claims 1 to 21 are now in this case.

Election of species has been required in the Office Actions dated March 27 and November 28, 2008. Applicant has elected Species A for component Z,



where $R = CH_3$;

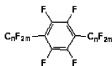
Species B for component Y,



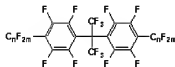
and Species A for component X,

$(CRR'_n)A(CRR'_m)$, wherein $R = H$, $R' = \text{alkyl}$; $n=0$, and $m=0$,
wherein $A = C_nF_{2n}$, linear or branched, $n=4-20$; or

A= a combination of perfluorinated aromatic and aliphatic structures such as:



and



wherein $n, m=0-4$.

The above election was made provisionally pending the allowance of a generic claim. Although the election was made without traverse, reconsideration of the requirement and especially the requirement set forth in the Office Action dated November 28, 2008, wherein Applicant was required to elect between numerous pages of species of component X that differ in whether they contain an R or H substituent and whether a subscript describing a substituent is selected from 0-4. It is clear that such fine line division of the claimed materials is erroneous and imposes a hardship on the applicant to file and prosecute numerous

applications to protect his invention. Such claims do not impose a hardship on the Examiner since there is relative ease of performing a comprehensive search of all of the species. Reconsideration and withdrawal of at least the additional requirement of election of species is respectfully requested.

The claims have been amended to more particularly define the invention and to obviate the basis for rejection under 35 U.S.C. 112.

Claims 1, 17 (sic, should be 7), and 13 stand rejected under 35 U.S.C. 112 for the reasons set forth at page 2 of the Office Action. The claims as amended are no longer subject to this ground of rejection.

Claims 2, 8, and 14 stand rejected under 35 U.S.C. 112 for the reasons set forth at pages 2 and 3 of the Office Action. The claims as amended are no longer subject to this ground of rejection.

Claims 1, 2, 5-8, 11-14, and 17-18 stand rejected under 35 U.S.C. 103 (a), as unpatentable over Singh et al, US Patent 5, 204, 126 in view of Yamana et al, U.S. Patent 5, 804, 674.

Claims 3, 10 and 16 stand rejected under 35 U.S.C. 103 (a), as unpatentable over Singh et al, US Patent 5, 204, 126 in view of Yamana et al, U.S. Patent 5, 804, 674, in further view of Nakakimura et al (JP 10-190245).

Claims 4, 9, and 15 stand rejected under 35 U.S.C. 103 (a), as unpatentable over Singh et al, US Patent 5, 204, 126 in view of Yamana et al, U.S. Patent 5, 804, 674, in further view of Takahashi, "Improvement of Photo Cured Composite Resin Using Low Viscosity Monomer Substituted by Fluorine", Journal of the Japanese Society for Dental Materials and Devices.

The present invention provides materials: with intrinsic release properties that can be shaped in the desired form, such as moulds with an aspherical lens profile; in which the profile may be controlled very accurately within tens of nanometers; in which the interfacial tension is such that release of the polymerised lens is facilitated; that provide excellent release of (photo)cured products from pre-shaped moulds made from these materials. In the invention, a mould is provided that omits the need for applying extra surface coatings on these moulds; and wherein the release properties remain constant even after high numbers of products are cured and released from a mould prepared from said polymerisable materials.

Singh et al, U.S. Patent 5, 204,126, the primary reference relied on in the Office Action, relates to surface coatings for cookware, laboratory ware, glass and plastic eyewear lenses, and on internal surfaces of molds used for casting optical lenses of plastic materials,

the surface coatings being formed from substances containing amphiphilic molecules. According to patentee, amphiphilic materials contain distinct polar and non-polar regions and may include as the polar segment a carboxylic acid and its salts, alcohols, thiols, amides, amines, cyanides, nitrates, phosphates, silane derivatives, and sulfonates. As the apolar segment, components such as alkyl and alkyl ethers, fluorinated alkyls or alkyl ethers which may include diacetylene, vinyl-unsaturated, fused linear or branched aromatic moieties, organic dyes, etc. Preferred film forming substances consist essentially of R_mSiX_n wherein R is an alkyl and alkyl ether, fluorinated alkyl or alkyl ether group of about 6-30 carbon atoms, X is halogen, hydroxyl and alkoxy, m is 0-3, n is 1-4, and m + n is 4. R may also be a substituted silane or siloxane. (See col. 4, lines 24-65). According to patentee, the film forming substance is mixed in a gel or gel-like carrier such as petrolatum, and applied to a substrate. (col. 5, lines 8-20). Where the film forming substance contains a polymerisable group, it may be cured; thus polymerisable groups as essential herein are not necessary. (col.6, lines 30-41). Patentee states at column 7, lines 23-28 “the sole material that forms the film in-situ on a substrate consists essentially of amphiphilic molecules. That is, the sole material in the finished film consists essentially of amphiphilic molecules from the film forming substance.” (emphasis added). It is noted that patentee discloses at col. 8, lines 61-68 that the release coating provided therein was effective to be reused to cast not less than 10 lenses and preferably more than 20 lenses.

It is clear that Singh et al does not disclose the claimed invention and does not render it obvious since it is directed to a method using different reactants and achieves different results as acknowledged by the Examiner.

Yamana et al, U.S. 5, 804, 674, the secondary reference does not cure the deficiencies of the primary reference, and, it is submitted, is not properly combined therewith in view of the primary reference disclosure that to be effective in the reference method, the sole material that forms the film must consist essentially of amphiphilic molecules which migrate to the surface and bond therewith. The secondary reference is contrary to this requirement. Yamana et al discloses a mold release agent derived from a composition that comprises multiple compounds including (A) a silane compound (present to crosslink the component (B); (B) a silicon and/or fluorine-containing compound having at least two hydroxyl groups or alkoxy groups in one molecule; and (C) a polymer of a perfluoroalkyl group-containing (meth)acrylate ester, the component (C) being incorporated into the crosslinked (A) and (B) components during a cross-linking step. Essential to the operation of the reference is a silane (component A) and a silicon and/or fluorine-containing compound having at least two

hydroxyl groups or alkoxy groups in one molecule (component (B), which are not disclosed by the primary reference as equivalents to the silanes, etc. disclosed therein. The instantly claimed polymerisable materials are compounds represented by the formula Z-X-Y. The references do not disclose or suggest a mould or method employing a polymerisable material as claimed herein.

Nakakimura, and Takahashi, the secondary references, are relied on as teaching that various of the compounds that may be used as the polymerisable material in the instantly claimed invention are known. It is asserted that it would be obvious to substitute the compounds of the secondary references in the moulding method to produce the claimed moulding method or to produce the claimed mould,

“to achieve the predictable results of molding optical components”.

It is again submitted that the basis for rejection is untenable. The instantly claimed invention obtains unexpected results that would not be predictable to those skilled in the art having the cited references before them. As discussed in the specification at pages 1 to 4, the present invention relates generally to a method of moulding materials in which a mould is used having a plurality of mould components with moulding surfaces together defining a moulding cavity, wherein at least part of the mould components are formed by polymerization of a polymerisable compound. The method is particularly applicable in a replica process which uses a mould or matrix having an accurately defined surface which is the negative of the desired optical profile of the replica lens and in which in the exact determination of the definition of the surface of the mould or matrix, the shrinkage of the synthetic resin of the replica lens has been taken into account. A small quantity of a liquid curable synthetic resin composition is provided on the surface of the mould. The lens body is then pressed with its refractive surface against the mould, or conversely, the synthetic resin spreads between the lens body surface and the mould surface. Instead of the mould, the lens body may alternatively be provided with the liquid synthetic resin composition. The synthetic resin is cured and the lens body together with the cured synthetic resin layer bonded thereto is removed from the mould. The free surface of the synthetic resin layer is the negative of that of the mould. See the specification, page 1. While such processes have many advantages, problems persist related to shrinkage, the development of large mechanical forces in the mould, premature release difficulties, adhesion of the lens formed to mould parts, etc..

Those working in the field have sought various solutions to these problems. Among methods tried has been the incorporation of additives such as zinc stearate in the mould materials or the inclusion of mould release agents. Unfortunately, these agents can adversely

affect mould surface texture or bulk polymer properties. Adjustments to the time, temperature, and heating profile of the cure and demould processes has also been used to affect the adhesion of the lens to at least one of the mould parts. Often, the adjustments to the cure and demould processes that might be helpful in solving the adhesion problem negatively affect the quality of the lens made. Mechanical and optical properties can be seriously eroded or altered. Materials with a low interfacial tension are known and often contain no or little polar groups and Si-O or F containing groups. For example, well-know fluoropolymers with low interfacial tension are teflon and teflon-copolymers (Kel-F, AF1600, etc). Other coatings have been applied on a mould for replication of lenses from materials with low polymerization shrinkage gaining an initial satisfactory release but also a fast deterioration of the lens due to wear of the mould. In practice less than 10 lenses could be released. Other strategies, such as adding reactive release agents to the mould-making formulation, can be followed to improve release from the mould, but haven't been successful. In one application, the replication of aspherical lenses for read-out of optical discs, glycidyl 3-(pentadeca-dienyl)phenylether (b.p. 305°C) has been added as co-reactive additive to the conventional DGEBA-diphenyliodonium antimonyhexa-fluoroarsenate/anthracene mould formulation but this remained without improvement of the release properties in this demanding application aiming at the replication of a mould in which the replicating monomer is confined in a closed cavity. The same was observed upon the addition of 0.1% (epoxycyclohexylethyl)methylsiloxane(2-3%)-dimethylsiloxane(97-98%) copolymer to the mould-making formulation. The addition of glycidyl 1,1,2,2-tetrafluoroethyl ether (b.p. 143°C) also proved unsuccessful. See the specification at pages 2 and 3. In contrast, the present invention provides intrinsic release, and after numerous replications, after 100 replication of 100 lenses in Example 3, no deterioration of either lens or mould surface had occurred and mould release remained high.

It should be apparent from the above that the Examiner's assertion of predictability flies in the face of the failure of those skilled in the art to achieve similar results with various compounds, and appears to be based on impermissible hindsight and the use of applicant's disclosure against him. The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). See also *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396 (quoting Federal Circuit). The rejection is untenable and should be withdrawn.

In view of the above remarks and amendment to the claims, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

Respectfully Submitted,

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